

WHAT IS CLAIMED IS:

1. An LCD device, comprising:

a liquid crystal panel having a plurality of pixels;

5 a backlight for supplying light;

a timing control circuit for generating a gate clock signal and a plurality of control signals, sensing whether or not data to be displayed in said liquid crystal panel is toggled, and generating a control signal for controlling a brightness of said backlight according to sensed results;

10 a gray scale voltage generating circuit for generating a plurality of gray scale voltages corresponding to said data to be displayed in said liquid crystal panel in response to said gate clock signal;

15 a gate driving circuit for scanning the pixels of said liquid crystal panel a row at a time in order, in response to the gate clock signal; and

20 a source driving circuit for generating liquid crystal driving voltages corresponding to the data to be displayed in said liquid crystal panel in response to the gray scale voltages and the control signals, and outputting generated liquid crystal driving voltages to said liquid crystal panel every scanning.

2. The LCD device according to claim 1, wherein said timing control circuit comprises:

a signal generating unit for generating the gate clock signal and the control signals; and

a flicker reducing unit for reducing visually recognized flickers by detecting of toggled data included in data of one frame to be displayed in said liquid crystal panel and controlling brightness of said backlight according to the detected number of toggled data.

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3. The LCD device according to claim 2, wherein said flicker reducing unit comprises:

a flicker sensing portion for sensing in pixel unit whether or not said data is flickered by detecting whether or not said data is toggled;

10 a first counter for counting the number of toggled data among data displayed in one line of said liquid crystal panel according to said flicker sensing portion;

15 a first comparator for detecting whether or not the entire data in the line is toggled by comparing the results from said first counter with a first standard value;

a second counter for counting number of the line where the entire data is toggled, according to the results detected by said first comparator; and

20 a second comparator for comparing the results from said second counter with a second standard value, and generating the control signal to dim the backlight when results from said second counter is the same as or higher than a second standard value.

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4. The LCD device according to claim 3, wherein said flicker sensing portion comprises:

a toggling detector for detecting whether or not each of bits in the data is

- 1 toggled by receiving said bits, delaying received bits for a given time period and  
2 performing XOR operation to each of delayed and non-delayed bits;  
3 an adder for counting the number of toggled bits among said bits forming said  
4 data in response to the results of said XOR operation to each of said bits generated  
5 from said toggling detector; and  
6 a third comparator for detecting whether the data is toggled by comparing the  
7 number of toggled bits with a third standard value.

10 5. The LCD device according to claim 3, wherein said flicker reducing unit  
generates control signal to restore the brightness of the backlight when the number of  
15 toggled data included in one frame is below the second standard value after the control  
signal for controlling dimmed the brightness of backlight.

15 6. The LCD device according to claim 5, wherein said flicker reducing unit  
can control the brightness of the backlight at more than one level.

20 7. A method for reducing flickers in an LCD device, comprising the steps of:  
inputting data in a timing controller of the LCD device;  
detecting whether or not inputted data is toggled;  
counting the number of toggled data in a line to be displayed in the LCD device;  
25 counting the number of toggled lines in a frame to be displayed in the LCD  
device; and  
controlling brightness of the LCD device according to the number of toggled

line.

8. The method for reducing flickers according to claim 7, wherein the step of detecting whether or not inputted data is toggled includes:

5 detecting whether or not each of bits forming the data is toggled by receiving the bits, delaying received bits for a given time and performing XOR operation to each of delayed and non-delayed bits;

10 counting the number of toggled bits using the results of the XOR operation; and comparing the number of toggled bits with a first standard value.

15 9. The method for reducing flickers according to claim 8, wherein the step of counting the number of toggled data in a line to be displayed in said LCD device includes:

10 increasing a first count value when the number of toggled bits is the same as the first standard value; and

15 comparing the first count value with a second standard value.

20 10. The method for reducing flickers according to claim 9, wherein the step of counting the number of toggled lines in a frame to be displayed in the LCD device includes increasing a second count value when the first count value is the same as the second standard value.

11. The method for reducing flickers according to claim 10, wherein the step

of controlling brightness of the LCD device according to the number of toggled line includes:

comparing the second count value with a third standard value; and  
dimming the brightness of the backlight when the second count value is the  
5 same as or higher than the third standard value.

12. The method for reducing flickers according to claim 11, wherein the step  
of controlling brightness of the LCD device according to the number of toggled line  
further includes restoring the brightness of the backlight when the second count value  
becomes below the third standard value after dimming the brightness of the backlight.

13. The method for reducing flickers according to claim 12, wherein the  
brightness of the backlight is set to be controlled at more than one level.